

**Table 1. Monitoring and Data Collection Information
Biological/Ecological Objectives**

Hypothesis/Question to be Evaluated	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comments/Data Priority
<p>1. Will larval and juvenile life stages of the target fish species (e.g., chinook salmon, steelhead, delta smelt, and splittail) utilize the restored wetland?</p> <p>H_0: Juvenile life stages of the target fish species will not use the restored wetland habitat.</p> <p>H_A: Juvenile life stages of the target fish species will use the restored wetland habitat.</p>	<p>Survey the young-of-the-year fish assemblages using the restored wetland monthly, using seining, light traps, and potentially other techniques for collecting juvenile fishes in vegetated habitats.</p>	<p>Based on sampling data, define the seasonal use of the restored wetland by the target fish species. In addition, document the overall seasonal species richness, composition, and relative abundance of young-of-the-year fishes using the restored wetland.</p>	<p>Species richness will define the number of species using the wetland, whereas species composition will define which species are using the wetland. Catch-per-unit-effort (CPUE) for specified sampling techniques will be used to describe the relative abundance of fishes at each sampling location. Data priority is high.</p>
<p>2. Do the fish species and life stages using the restored wetland use the various habitat types created differentially?</p> <p>H_0: Specific fish species and life stages using the restored wetland do not selectively use the various habitat types monitored.</p> <p>H_A: Specific fish species and life stages using the restored wetland selectively use the various habitat types monitored.</p>	<p>Fish surveys conducted to address this question, and #1 (above), will be conducted under a repeated measures, stratified-random sampling design. The restored wetland will be stratified by distinct habitat types (e.g., feeder channels, intertidal areas, water-mound interface, emergent vegetation), with fish sampling conducted repeatedly over time at replicate sites for each habitat assessed.</p>	<p>Determine the relative abundance of fish species and life stages utilizing each wetland habitat type monitored. Using statistical procedures (e.g., analysis of variance, including use of analysis of variance by ranks as warranted and Tukey multiple comparison test), relate relative abundance of fishes sampled to habitat type. CPUE data will be transformed by taking the logarithm of CPUE values plus 1. For analysis of variance procedures, the time factors will be regarded as a repeated measure. A physical characterization of each wetland habitat type monitored will be made.</p>	<p>This analysis will assess the effect of physical habitat characteristics on fish distribution within the wetland. Both parametric and nonparametric statistical procedures will be used, as appropriate, for conducting data analyses. Data priority is high.</p>

**Table 1. Monitoring and Data Collection Information
Biological/Ecological Objectives**

Hypothesis/Question to be Evaluated	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comments/Data Priority
<p>3. What are the relationships between specific water quality parameters (e.g., salinity) and target fish species use of the restored wetland habitats monitored?</p> <p>H_0: Target fish species use of the wetland habitats monitored is not affected by water quality.</p> <p>H_A: Target fish species use of the wetland habitats monitored is affected by one or more water quality parameters.</p>	<p>Measure temperature, dissolved oxygen, salinity, turbidity, conductivity, and pH levels at the time and location of fish sampling.</p>	<p>Apply appropriate statistical procedures (e.g., multi-factor analysis of variance, including use of analysis of variance by ranks, regression) to determine whether the water quality parameters monitored significantly influence fish relative abundance (CPUE) within the wetland and, to the degree possible, at specified habitat types.</p>	<p>This analysis will assess the effect of the water quality parameters specified on fish distribution within the wetland. Data priority is moderate.</p>
<p>4. What are the growth rates and successional patterns of riparian and intertidal vegetation communities where restoration plantings are made?</p> <p>H_0: Growth rates and succession within riparian and intertidal vegetation communities will not be affected by restoration plantings</p> <p>H_A: Growth rates succession within riparian and intertidal vegetation communities are affected by one or more involved restoration planting.</p>	<p>Delineate all planted areas as well as unplanted control sites. The total area available will be stratified geographically by habitat type, and survey sites selected randomly from each habitat type. Vegetation surveys, using established transects within the selected sites, will be performed monthly from March through September.</p>	<p>Riparian and intertidal plant species richness, composition, cover, and distribution will be documented and compared over time, both within and among sites surveyed. Survival rates for various species of vegetation planted will be estimated.</p>	<p>Data priority is high.</p>

**Table 1. Monitoring and Data Collection Information
Biological/Ecological Objectives**

Hypothesis/Question to be Evaluated	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comments/Data Priority
<p>5. Is vegetation planting an effective measure in wetland restoration?</p> <p>H_0: Planted sites do not maintain or increase (over time) their community differences (e.g., vegetation species richness, composition, cover, and distribution) that were initially established by planting efforts.</p> <p>H_A: Planted sites maintain and/or increase (over time) their community differences (e.g., species richness, composition, cover, and distribution) that were initially established by planting efforts.</p>	<p>Monthly vegetation surveys conducted at planted and unplanted sites, as described under #4 and #5 (above).</p>	<p>Estimate the survival rates for various species planted, and compare community structure (e.g., species richness, composition, cover, and distribution) between restored and unrestored sites.</p>	<p>Comparisons between restored and restored sites will primarily be descriptive in nature, but statistical procedures will be applied, as appropriate and warranted, to effectively address the question and associated hypothesis. Data priority is high.</p>
<p>6. Are the restoration techniques used in this pilot project successful in restoring and maintaining the physical habitat features?</p> <p>H_0: The restoration techniques of this pilot project do not affect restoration of the native characteristics described.</p> <p>H_A: The restoration techniques of this pilot project effectively restore identified native characteristics.</p>	<p>Monitor the physical condition of the feeder channels, habitat mounds, riverbank breach, and vegetation plantings monthly over time.</p>	<p>Evaluate the condition of these key project features in relation to their: 1) characteristics upon initial construction; and 2) ultimate target or design characteristics.</p>	<p>This assessment, coupled with #4 and #5 (above), will document the degree to which physical design features were successfully created and maintained within the restored wetland habitat. Data priority is high.</p>

**Table 1. Monitoring and Data Collection Information
Biological/Ecological Objectives**

Hypothesis/Question to be Evaluated	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comments/Data Priority
<p>7. Will the restoration techniques applied in this pilot study effectively control the proliferation of invasive non-native plant species?</p> <p>H_0: The restoration techniques in this pilot project do not affect the proliferation of invasive non-native plant species.</p> <p>H_A: The restoration techniques applied in this pilot project effectively control the proliferation of non-native invasive plant species.</p>	<p>Using the approach applied in #4 (above), vegetation surveys using established transects will be performed monthly from March through September in restored and unrestored (control) areas.</p>	<p>Evaluate the presence of non-native plant species (1) prior to initial construction; and (2) at intervals corresponding to monitoring of progress in riparian and intertidal vegetation communities.</p>	<p>Data priority is moderate.</p>

Local Involvement

County Notification. Gary Lane of the Solano County Department of Environmental Management received a copy of the Initial Study/Proposed Negative Declaration completed for the project in December 1997. No written comments were received from the County on the project. Recent discussions with the County indicate a general concern that agricultural lands in the Delta are being converted to non-agricultural uses through programs such as this. The County also indicates that, depending upon final land negotiations, County approval for conversion of the land to wetland/ecosystem uses may be required as part of the permitting process for implementing the project.

Local Interested Parties. MegaSand is leasing other portions of the island for sand mining and has expressed support for implementing the project. MegaSand has offered use of its Horseshoe Bend docking and landing areas for project activities. The CDFG owns 35 acres at the northern (upstream) end of the island, and has previously expressed support for the project.

The project team has obtained peer review of its planning activities through informal agency consultations and the IEP Resident Species Coordination Team. The project team has also sought the participation of others interested in study activities that could complement the proposed studies. Commitments of interest have been previously received from DWR's MWQI Unit and from graduate students of the UCD Department of Land, Air and Water, as discussed earlier. Coordination with DWR and UCD during the previous CALFED project phase yielded preliminary study proposals that focus on water quality.

In addition to the above parties and agencies, the Corps, USFWS, NMFS, and National Audubon Society have been informed of the project. The Corps has been involved in a wetland delineation of the project site, and the USFWS and NMFS have been consulted on project design, permitting, and scientific collection permits for monitoring activities.

Public Outreach Plan. Public outreach will include both public involvement and public information activities. Public involvement activities will be conducted as part of the environmental regulatory review (CEQA) process and include notices announcing the opportunity for public review and comment on the proposed final design for the habitat enhancements on Decker Island. Public information activities will follow public involvement and consist of preparing and sending newsletters to interested parties. The list will be compiled from past and future project planning activities and will be composed of local landowners, individuals and interest groups who commented on the updated initial study, and permitting and consulting agencies, along with any other interested persons. Newsletters will be sent out after completion of major project milestones. It is anticipated that such milestones include environmental document finalization, project construction and vegetation planting work, and project monitoring. The newsletters will identify and describe project progress, including the results of the two-year monitoring program.

Property Use/Access. Prior to start of the project, a final agreement will have to be reached between CALFED and the Port concerning land rights, as discussed on page 10. Project construction at the site will not be undertaken until the agreement has been executed. MegaSand has offered use of its dock and landing area on Horseshoe Bend for project activities.

Third Party Effects. Initial project analyses have not identified any adverse effects to third parties. MegaSand operations will not be affected by the restoration of the tidal wetland.

Cost

Budget. Project implementation would be accomplished over approximately 3 years and involve three phases, as identified previously in the Project Description. The anticipated budget is provided in **Table 2**. **Table 3** provides a quarterly budget breakdown. Total anticipated costs, excluding land rights to the 140-acre project site, would be approximately \$379,000.

Schedule. A preliminary schedule of completion dates for key project tasks and milestones is presented below.

<u>Task</u>	<u>Start/Completion Date</u>
Receive CALFED Approval	July 1999
CALFED/Port Reach Land Agreement	July-October 1999
CALFED/Port Execute Land Agreement	October 1999-May 2000
Phase I: Final Design	
<i>Finalize Project Design</i>	October-December 1999
<i>Obtain Required Permits</i>	October 1999-May 2000
<i>Develop Monitoring/Methods Program</i>	January-March 2000
<i>CEQA/NEPA Update</i>	January-May 2000
Phase II: Project Construction	
<i>Prepare Construction Bid Specifications</i>	February-May 2000
<i>Solicit Construction Bids</i>	June 2000
<i>Award Construction Contract</i>	July 2000
<i>Perform Habitat Enhancements</i>	September-October 2000
<i>Prepare Project Construction Report</i>	October 2000-January 2001
Phase III: Project Monitoring	
<i>Conduct Monitoring Program</i>	October 2000-October 2002
<i>Submit 2000-2001 Monitoring Report (Year 1: October 2000-October 2001)</i>	December 2001
<i>Submit 2001-2002 Monitoring Report (Year 2: October 2001-October 2002)</i>	December 2002
<i>Develop Subsequent Years Monitoring Program</i>	December 2002

Table 2. Total Budget - Decker Island Tidal Wetland Enhancement Pilot Project

Task	Direct Labor Hours	Direct Salary and Benefits	Service Contracts	Material and Acquisition Costs	Miscellaneous and Other Direct Costs	Overhead and Other Direct Costs	Total Cost
<i>Pre-Project Land Acquisition (permanent easement or land purchase)</i>					To be negotiated		To be negotiated
Phase I: Final Design							
Task 1: Finalize Project Design							\$13,000
<i>Subtask 1a: Prepare revised draft design plans</i>	46	\$2,400	\$1,400		\$400		\$4,200
<i>Subtask 1b: Hold technical workshop on draft design plans with CALFED and IEP members</i>	28	\$1,800	\$800		\$500		\$3,100
<i>Subtask 1c: Finalize project design plans and prepare final design report</i>	46	\$2,400	\$1,400		\$400		\$4,200
<i>Subtask 1d: Formalize coordination with other research projects (e.g., DWR, UC Davis)</i>	16	\$1,500					\$1,500
Task 2: CEQA/NEPA Update							\$26,250
<i>Subtask 2a: Revise and release proposed Initial Study/ Environmental assessment, Negative Declaration and Finding of No Significant Impact</i>	184	\$13,200	\$1,600		\$2,500		\$17,300
<i>Subtask 2b: Respond to comments, finalize Negative Declaration and FONSI, and issue notices</i>	74	\$5,650	\$800		\$2,500		\$8,950
Task 3: Develop Monitoring Program							\$25,800
<i>Subtask 3a: Prepare draft monitoring methods program</i>	204	\$14,400	\$4,400		\$500		\$19,300

Table 2. Total Budget - Decker Island Tidal Wetland Enhancement Pilot Project

Task	Direct Labor Hours	Direct Salary and Benefits	Service Contracts	Material and Acquisition Costs	Miscellaneous and Other Direct Costs	Overhead and Other Direct Costs	Total Cost
<i>Subtask 3b: Review draft monitoring methods program at the CALFED and IEP technical meeting (See Subtask 1b above), and finalize monitoring program</i>	64	\$4,400	\$1,600		\$500		\$6,500
Task 4: Obtain Required Permits							\$22,700
<i>Subtask 4a: Obtain scientific collection permit</i>	52	\$5,000					\$5,000
<i>Subtask 4b: Obtain U.S. Army Corps of Engineers Section 404 permit and complete ESA consultations</i>	120	\$11,400	\$800		\$200		\$12,400
<i>Subtask 4c: Obtain Water Quality Certification or exemption (Section 401 of the Clean Water Act)</i>	16	\$1,600					\$1,600
<i>Subtask 4d: Obtain Streambed Alteration Agreement</i>	14	\$1,400			\$200		\$1,600
<i>Subtask 4e: Obtain Solano County Grading permit</i>	16	\$1,600			\$500		\$2,100
Phase II: Project Construction							
Task 1: Prepare Construction Specifications							\$18,650
<i>Subtask 1a: Prepare draft construction specifications</i>	82	\$1,800	\$5,050		\$300		\$7,150
<i>Subtask 1b: Hold project team meeting to review construction specifications</i>	16	\$800	\$800				\$1,600
<i>Subtask 1c: Finalize construction specifications, issue request for construction bids, and award construction contract</i>	118	\$3,200	\$6,700				\$9,900

Table 2. Total Budget - Decker Island Tidal Wetland Enhancement Pilot Project

[illegible]

[illegible][illegible]

[illegible][illegible]

Table 3. Quarterly Report - Decker Island Tidal Wetland Enhancement Pilot Project

Task	Oct-Dec 1999	Jan-Mar 2000	Apr-Jun 2000	Jul- Sep 2000	Oct-Dec 2000	Jan- Mar 2001	Apr- Jun 2001	Jul- Sep 2001	Oct- Dec 2001	Jan- Mar 2002	Apr- June 2002	Jul- Sep 2002	Oct-Dec 2002	Total Budget
Task 2: Construct Habitat Enhancements														
Subtask 2a: Excavate feeder channels, construct habitat mounds, and breach riverbank					\$85,000									\$85,000
Subtask 2b: Construction monitoring					\$6,850									\$6,850
Subtask 2c: Seed riverbank breach and plant vegetation					\$7,000									\$7,000
Subtask 2d: Implement star thistle and water hyacinth control measures					\$3,000									\$3,000
Subtask 2e: Conduct as-built surveys and prepare project construction report					\$4,500	\$5,550								\$10,050
Phase III: Project Monitoring														
Task 1: Implement Monitoring Program														
Subtask 1a: Conduct monitoring program					\$12,350	\$12,350	\$12,350	\$12,350	\$12,350	\$12,350	\$12,350	\$12,350		\$98,800
Subtask 1b: Annual monitoring reports									\$10,500				\$10,500	\$21,000
Task 2: Develop Subsequent 5-10 Year Monitoring Program													\$9,000	\$9,000
Project Management														
Contract management	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$250	\$250	\$250	\$1,500	\$250	\$250	\$750	\$2,000	\$15,500

Table 3. Quarterly Report - Decker Island Tidal Wetland Enhancement Pilot Project

Task	Oct-Dec 1999	Jan-Mar 2000	Apr-Jun 2000	Jul- Sep 2000	Oct-Dec 2000	Jan- Mar 2001	Apr- Jun 2001	Jul- Sep 2001	Oct- Dec 2001	Jan- Mar 2002	Apr- June 2002	Jul- Sep 2002	Oct-Dec 2002	Total Budget
<i>Schedule tracking and quarterly progress reports</i>	\$600	\$600	\$500	\$500	\$700	\$500	\$500	\$500	\$700	\$500	\$500	\$600	\$700	\$7,400
<i>Public outreach activities</i>			\$2,000		\$3,000				\$2,000				\$1,750	\$8,750
TOTAL	\$16,100	\$61,650	\$32,450	\$8,400	\$124,400	\$18,650	\$13,100	\$13,100	\$27,050	\$13,100	\$13,100	\$13,700	\$23,950	\$378,750

Cost Sharing

The project would be funded entirely by CALFED.

Applicant Qualifications

Project Team. The project team responsible for planning, designing, and implementing the project includes Surface Water Resources, Inc., Hanson Environmental, Inc., and Laugenour and Meikle. The technical responsibilities of the project team include the following:

- ▶ Permitting, project management, and assisting with habitat improvement design and monitoring (SWRI);
- ▶ Project design, endangered species consultations, monitoring design, and post-construction monitoring (HEI); and
- ▶ Engineering design, construction monitoring, and as-built surveys (L&M).

Individual Responsibilities and Qualifications.

Figure 6 shows the proposed project organization and team members responsible for the identified tasks.

David Schuster - Principal-in-Charge (SWRI). Mr. Schuster has participated in the development of much of the significant water policy in California in recent years, including the historic Bay/Delta Accord that brought federal, state, environmental, agricultural, municipal, and industrial interests to agreement on water quality standards for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Mr. Schuster was formerly the Assistant Regional Director for the Mid-Pacific Region of the U.S. Bureau of Reclamation, and General Manager for the State Water Contractors.

Rick Lind - Project Manager (SWRI) - Mr. Lind will serve as the project manager on this project, as well as coordinate construction planning and permitting. He is a senior project manager whose expertise is in California and federal environmental regulatory compliance and agency/public consultation for water and energy-related project development, programs, and permitting. Mr. Lind was the project manager for the previous Decker Island Pilot Project, including the design of targeted fisheries, waterfowl, upland, and riparian habitat improvements.

Paul Bratovich - Senior Fisheries Biologist (SWRI) - Mr. Bratovich will be responsible for aquatic habitat restoration design. Mr. Bratovich has worked as a fisheries consultant and water resources specialist in California for the past 15 years. Mr. Bratovich has conducted analyses on numerous listed, proposed listed, and other special-status aquatic species as part of incidental take permit processes, habitat conservation plans, and watershed management plans. His experience includes regulatory and technical consultations with the CDFG, NMFS, USFWS, and other agencies concerning habitat restoration, endangered species, flow-habitat relationships, population dynamics, and strategic water planning.

Charles Hanson, Ph.D. - Senior Fisheries Biologist (HEI) - Dr. Hanson will be in charge of aquatic monitoring design and post-construction monitoring activities. Dr. Hanson has more than 25 years of experience in freshwater and marine biological studies. He has contributed to the study, design, analysis, and interpretation of fisheries, stream habitat, and stream flow data collected in the evaluation of instream flow requirements and potential fishery impacts on salmonid spawning, production, and migration success. Dr. Hanson has been extensively involved in incidental take monitoring and investigations of endangered species, development of recovery plans, consultations, and preparation of aquatic habitat conservation plans.

Rich Jenness - Professional and Registered Engineer (L & M) - Mr. Jenness will be responsible for engineering design and construction monitoring. Mr. Jenness serves as district engineer for reclamation and irrigation districts, community service districts, and assessment districts in the Sacramento Valley.

His expertise includes project planning, engineering, and management for a wide range of agricultural, commercial, industrial, and municipal projects, including levees, wastewater and water systems, drainage, streets, roads, and related infrastructure.

Michael Bryan, Ph.D. - Senior Scientist (SWRI) - Dr. Bryan will work closely with Dr. Hanson on aquatic monitoring design and Mr. Bratovich on aquatic habitat restoration design. Dr. Bryan has 12 years of combined research and consulting experience. His expertise includes fisheries biology and aquatic ecology, water quality, experimental design, and ecological risk assessment. He has extensive experience conducting fishery studies and assessing the effects of water quality on fish and other aquatic organisms. Dr. Bryan has experience in assessing impacts to aquatic life at the biochemical, cellular, organismal, population, and community levels. Dr. Bryan's experience includes technical and regulatory consultations with CDFG, NMFS, USFWS, and other agencies concerning habitat restoration enhancement, flow habitat relationships, CEQA/NEPA documentation, and NPDES permitting and compliance.

Dennis Hood - Aquatic Biologist (HEI) - Dennis hood will perform the majority of aquatic monitoring. Mr. Hood has worked as a fish and wildlife biologist for the past 10 years, with experience in fisheries and aquatic ecology, wildlife biology, and threatened and endangered species management. He has supervised and participated in several aquatic and terrestrial field investigations including fish community surveys, benthic community surveys, field surveys involving state and federally listed species, habitat characterization and delineation, and water quality assessments. He has also been involved in fish and wildlife impact analysis and in developing, implementing, and monitoring mitigation measures on several projects.

Steve James - Biologist (SWRI) - Steve James will be responsible for terrestrial habitat design, monitoring, and permitting issues. Mr. James' expertise is in California and federal ESA consultation and compliance, habitat conservation planning, mitigation monitoring, and wetland and vernal pool habitat studies. He has served as technical team leader in the preparation and analysis of coastal riparian and freshwater marsh restoration projects. He has also designed biological mitigation programs for riparian habitat in agricultural areas.

Potential Conflicts of Interest. There are no known conflicts of interest.

Project Team Organization

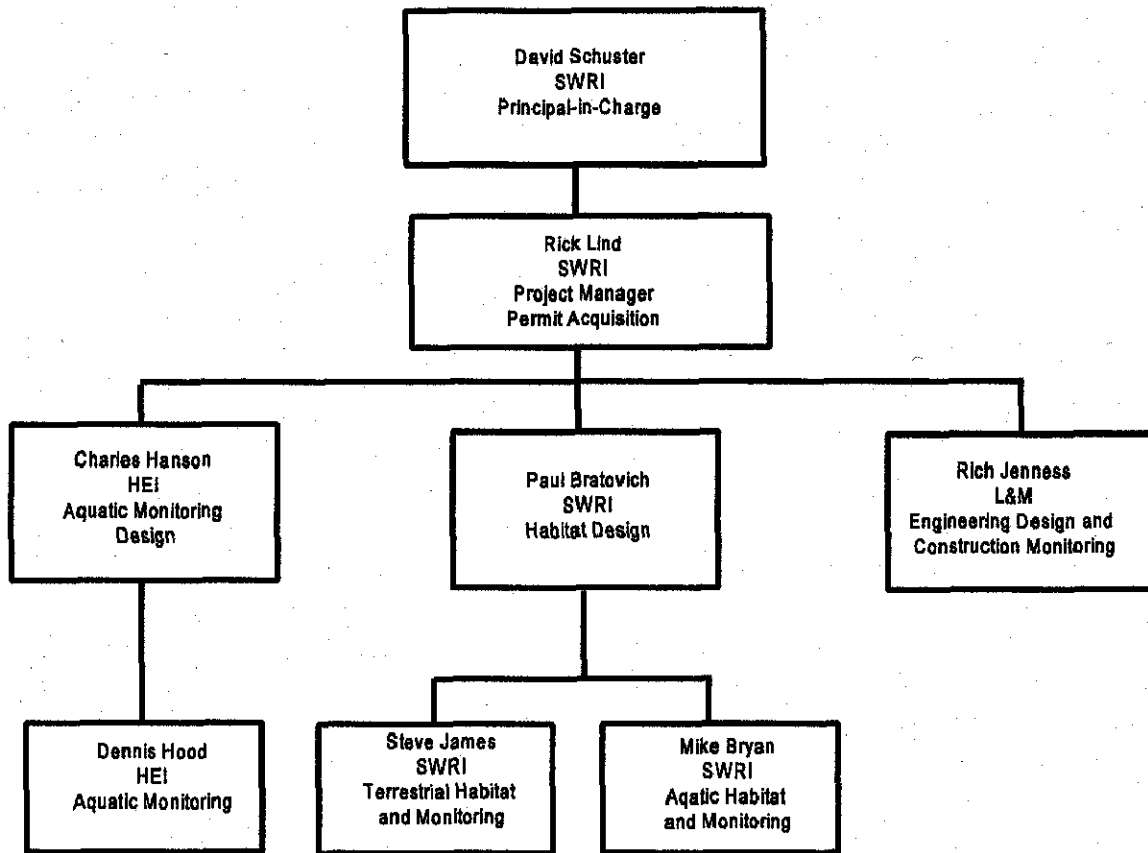


Figure 6